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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,988	.02/05/2001	Shizukuni Yata	SAEGU64.001APC	4472

20995 7590 10/23/2003

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EXAMINER

Cantelmo, Gregg

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/23/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/700,988	YATA ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,10 and 27-29 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6,5</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-10 and 29-29 in Paper No. 11 is acknowledged.

Response to Amendment

2. In response to the amendment received August 11, 2003:
 - a. Claims 11-26 and 30 have been cancelled. Claims 1-10 and 27-29 are pending.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

4. The information disclosure statement dated December 20, 2002 has been placed in the application file and the information referred to therein has been considered as to the merits.
5. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the

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list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. For example, page 3 of the specification recites numerous foreign patents, at least some of which are not provided on an information disclosure statement.

Drawings

6. The drawings received February 25, 2001 are acceptable for examination purposes.

Specification

7. The amendment filed August 11, 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: in particular of the capacity of the negative electrode being 400 Ah/cm³ or greater. The original disclosure teaches of the capacity of the negative electrode being 400 mAh/cm³ or greater and the value of 400 Ah/cm³ as recited in the amended claims has been interpreted as 400 mAh/cm³. This applies to claims 3 and 4.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

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8. Claims 27-29 objected to because of the following informalities: claims 27-29 are dependent on either claim 1 or cancelled claim 11. It is advised to amend claim 27 to delete the dependency to claim 11. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 3, 5 and 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 3 recites an electrode capacity of 400 Ah/cm³ or greater for a battery which is less than 12 mm. It is not understood if this limitation is a typographical error (i.e. should be mAh as oppose to Ah). There is a significant difference in this value as opposed to the current value recited in claim 6 for example. The limitation has been interpreted to be mAh;
- b. Claim 5 recites the phrase "particles having (d002) spacing or (002) planes" the or language is not readily understood on its own. The Examiner has interpreted this limitation in light of the specification to be "spacing of (002) planes";
- c. The range of the electrode density in current claim 6 is indefinite (120 to 1.60 g/cm³). It may be that 120 should be 1.20 and the range has been interpreted as 1.20 to 1.60 g/cm³ (see original claim 6 for support for 1.20).

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 2 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,569,520 (Bates).

Bates discloses a non-aqueous secondary battery comprising positive and negative electrodes (col. 5, ll. 13-17 and 34-37) and a lithium salt-containing electrolyte (col. 6, ll. 32-38) the battery has an volumetric energy density of 670 Wh/L (col. 5, ll. 33-37) for a battery volume of 60 L (col. 5, ll. 33), thus the energy capacity for the cell is over 30 Wh. Each cell 84 includes a 10 micron thick cathode, 9 micron thick anode and 1 micron thick electrolyte (col. 5, ll. 12-17) for a total cell thickness of 20 microns. The battery stack has 54 of these cells (col. 5, ll. 31-33) giving rise to a total thickness of 1080 microns or 1.08 mm (as applied to claim 1).

The positive electrode contains manganese oxide (col. 5, ll. 8-10 and 60-68 as applied to claim 2).

The battery is of a rectangular shape (Fig. 10 as applied to claim 9).

Claim Rejections - 35 USC § 103

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13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of EP 0808798-A2 (EP '798).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The differences not yet discussed are of using double-structure graphite having graphite based-particles and amorphous carbon layers covering the particles, the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher (claim 5) or of the active material comprising a graphite carbon material (claim 7).

With respect to the graphite material (claims 5 and 7):

EP '798 teaches of using double structure graphite particles in a negative electrode wherein the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher. The particles having an average particle diameter of 1-50 microns as active material (abstract, page 4, ll. 1-24).

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The motivation for using the graphite particles as taught by EP '798 is that it inhibits the decomposition of the electrolytic solution, increases the discharge capacity of the cell and improve cycling characteristics.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by using the graphite particles as taught by EP '798 since it would have inhibited the decomposition of the electrolytic solution, increased the discharge capacity of the cell and improved cycling characteristics.

With respect to the product-by-process limitations of claim 7:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to

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come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

In the instant case, EP '798 teaches of providing mesocarbon particles to the negative electrode. The process conditions recited in claim 7 bear no weight to the patentability of the claimed invention, a battery. Further the term volatile components is not clearly understood as a positive component of the final product since the baking process appears to remove the volatile components from the graphite (see pages 40-45). Since the end product of the combination of the prior art obviates providing a mesocarbon graphite material to the anode, the prior art is held to render claim 7 as obvious.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of EP 0808798-A2 (EP '798) as applied to claim 5 and in further view of

The teachings of claims 1, 2 and 5 have been discussed above and are incorporated herein.

The differences not yet discussed are of using double-structure graphite having an average particle diameter of 1-50 microns as active material in a negative electrode having a porosity of 20-35%, an electrode density of 1.20-1.60 g/cm³ and a capacity of 400 Ah/cm³ or higher (claim 5).

16. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of JP 06-295744 A (JP '744).

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The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The differences not yet discussed are of using double-structure graphite having graphite based-particles and amorphous carbon layers covering the particles, the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher (claim 5) or of the active material comprising a graphite carbon material (claim 7).

With respect to the graphite material (claims 5 and 7):

JP '744 teaches of using double structure graphite particles in a negative electrode wherein the graphite particles having (d002) spacing of (002) planes of not more than 0.34 nm and the carbon layers having (d002) spacing of (002) planes of 0.34 nm or higher. The particles having an average particle diameter of 1-50 nm as active material (abstract and claims).

The motivation for using the graphite particles as taught by JP '744 is that it inhibits the decomposition of the electrolytic solution, increases the discharge capacity of the cell and improve cycling characteristics.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by using the graphite particles as taught by JP '744 since it would have inhibited the decomposition of the electrolytic solution, increased the discharge capacity of the cell and improved cycling characteristics.

With respect to the product-by-process limitations of claim 7:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

In the instant case, JP '744 teaches of providing mesocarbon particles to the negative electrode. The process conditions recited in claim 7 bear no weight to the patentability of the claimed invention, a battery. Further the term volatile components is not clearly understood as a positive component of the final product since the baking

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process appears to remove the volatile components from the graphite (see pages 40-45). Since the end product of the combination of the prior art obviates providing a mesocarbon graphite material to the anode, the prior art is held to render claim 7 as obvious.

17. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of U.S. patent No. 6, 040,078 (Fauteux).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The difference between instant claim 6 and Bates is that Bates does not disclose the thickness of the battery case.

Fauteux discloses of a battery casing having a thickness between 0.3 and 0.4 mm (col. 3, ll. 61-67).

The motivation for providing a battery casing of this thickness is to provide a relatively lightweight battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by providing a battery casing having a thickness between 0.3 and 0.4 mm since it would have provided a relatively lightweight battery.

18. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of U.S. patent No. 6,156,459 (Negoro).

The teachings of claims 1 and 2 have been discussed above and are incorporated herein.

The differences between instant claims 27-29 and Bates are that Bates does not disclose measuring operation parameters of the battery and controlling the parameters based on the results of the measurements.

Negoro teaches of monitoring and controlling parameters of the cell including internal pressure, overcurrent and overcharging and discharging of the cell (paragraph bridging columns 32 and 33).

The motivation for monitoring and controlling these cell parameters is that it prevents cells from exploding and prevents overcurrents from occurring and enhances the operational safety of the battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates by monitoring and controlling parameters such as internal pressure and current since it would have prevented cells from exploding, prevented overcurrented from occurring and enhanced the safety operation of the cell.

Allowable Subject Matter

19. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record appears to adequately teach, suggest or render obvious the invention of claim 8.

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In particular, none of the prior art of record appears to provide adequate teaching or suggestion of a flat shaped battery having a thickness of less than 12 mm as recited in claim 1 further having all of the particular negative electrode limitations of claim 8.

Further while individually the use of graphite such mesocarbon or a combination of amorphous carbon coated graphite having an average diameter and packing density as recited in claim 8 is known in the art as taught by some of the prior art of record, these references do not clearly teach or suggest that such arrangements can be suitably applied to a battery having the size of Bates and meet the capacity output of at least 400 mAh/cm³.

21. Claims 3, 4 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

In particular, none of the prior art of record none of the prior art of record appears to adequately teach, suggest or render obvious the invention of claims 3 and 6 comprising the flat shaped battery having a thickness of less than 12 mm as recited in claim 1 further having all of the particular negative electrode limitations of claims 3 or 6.

Further while individually the use of graphite such mesocarbon or a combination of amorphous carbon coated graphite having an average diameter and packing density as recited in claims 3 and 6 is known in the art as taught by some of the prior art of record, these references do not clearly teach or suggest that such arrangements can be suitably applied to a battery having the size of Bates and meet the capacity output of at least 400 mAh/cm³.

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Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPATs 5,951,959; 5,856,043 and 5,451,477 as well as EP 0675555 B1 each disclose providing graphite materials in the negative electrode of a cell.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo
Patent Examiner
Art Unit 1745

gc



October 16, 2003